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San Francisco, California
1946

THE PAN-PACIFIC ENTOMOLOGIST

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STUDIES ON NORTH AMERICAN MORDELLIDAE, IV.[1]

(Coleoptera)

[1]Studies on North American Mordellidae, III. Pan-Pac. Ent., 22:90, 1946.

BY EUGENE RAY
Chicago, Illinois

This is the fourth of a series of papers dealing with North American members of the family. Two species are described from Illinois, two from Arizona, one from Idaho and one from Florida and Mississippi. Notes have been added for sixteen previously known forms.

Mordella longipalpis Ray, new species

(Figs. 3, 10)

Form robust, cuneiform, sides of elytra straight on basal three-fourths. Derm black, four basal segments of antennae fuscous, a narrow castaneous line along apex of front. Body densely covered with fine, recumbent pubescence, partaking of ground color, except on head, margins of pronotum and basal angles of abdominal segments, where it is cinereous and on the elytra, where in certain lights it has a violaceous tinge.

Antennae 1.6 mm. long, segments 1 and 2 large, equal; 3-4 equal in length, the latter somewhat broader; 5-10 each no longer than 4 but considerably broader, serrate, forming a loose, elongate club; 11 two-thirds longer than 10, serrate, broadest before middle, apical edge straight, angles rounded. Terminal segment of maxillary palpi enlarged, three times as long as broad, basal margin curved, other two sides almost straight, angles rounded.

Pronotum one-third broader than long (2.58 x 1.9 mm.), anterior margin and sides rounded, broadest before base, the latter arcuate, midbasal lobe short, broad, rounded. Scutellum large, as long as broad, triangular, sides straight, apex rounded.

Elytra less than twice as long as broad (4.63 x 2.47 mm.), slightly narrower at base than pronotum, sides straight on basal three-fourths, thence curved to apex, apices individually rounded. Anterior and intermediate tibiae longer than their tarsi, third and fourth segments shortest, equal. Anal style robust, sides but slightly constricted beyond middle, truncate at apex, twice length of hypopygium (1.58 x .8 mm.). Posterior tarsal claws with six teeth, basal one rudimentary, terminal one longest.

Length: to apices of elytra, 6.53 mm.; to tip of anal style, 8.11 mm.

One specimen: *Holotype*, sex undetermined, GALENA, ILLINOIS, July 10, 1929 (Frison-Hottes); in the collection of the Illinois State Natural History Survey.

This species should be placed between *capillosa* Liljeblad[2] and *quadripunctata* (Say)[3] in a systematic series. It may be separated from these species chiefly by the maxillary palpi, which are much more elongate than in any other North American member of the genus. *Longipalpis*, in addition, lacks the whitish elytral spots of these two forms and the antennae are distinctly different.

MORDELLA INSULATA LECONTE

Mordella insulata LeConte, 1859. Smiths. Contr. 11:16.

One specimen: Lima, Illinois, July 29, 1936 (Mohr-Burks).

Mordellistena uniformis Ray, new species
(Fig. 2, 11)

Form narrow, elongate, sides subparallel. Derm black, antennae fuscous, maxillary palpi and anterior legs fuscocastaneous. Surface densely covered with fine, recumbent, cinereous pubescence.

Head strongly convex, but slightly narrower than the pronotum; eyes entire, rather densely covered with short, fine, erect hairs. Antennae .68 mm. long, reaching beyond base of pronotum; segments 1-2 large, globose, equal; 3-4 equal in length, the latter distinctly broader; 5-10 each one-third longer and slightly broader than 4, broadest apically, narrowing somewhat on distal segments; 11 one-fourth longer and slightly broader than 10, broadest medially, sides and angles rounded. Terminal segment of maxillary palpi enlarged, form of an elongate scalene triangle, apical edge strongly rounded, distinctly longer than mesal margin, latter and outer edge almost straight, angles rounded.

Pronotum distinctly broader than long (.53 x .45 mm.), finely and completely margined, apex and sides strongly rounded, basal angles obtuse, base arcuate, midbasal lobe broad, very short, subtruncate. Scutellum small, broad, triangular, apex broadly rounded.

Elytra more than two and one-half times as long as broad (1.36 x .53 mm.), sides subparallel on basal half, thence curved to apex, apices individually rounded. Anterior and intermediate tarsi longer than their tibiae, filiform, penultimate segment shortest. Posterior tibiae and basitarsi each with a single, short ridge one-fifth from apex; no ridges on second segment of tarsi. Anal style slightly more than twice length of hypopygium (.57 x .26 mm.),

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[2]Misc. Publ. Mus. Zool., Univ. Mich., 1946, 62:35.
[3]Amer. Ent., 1824, 3:276.

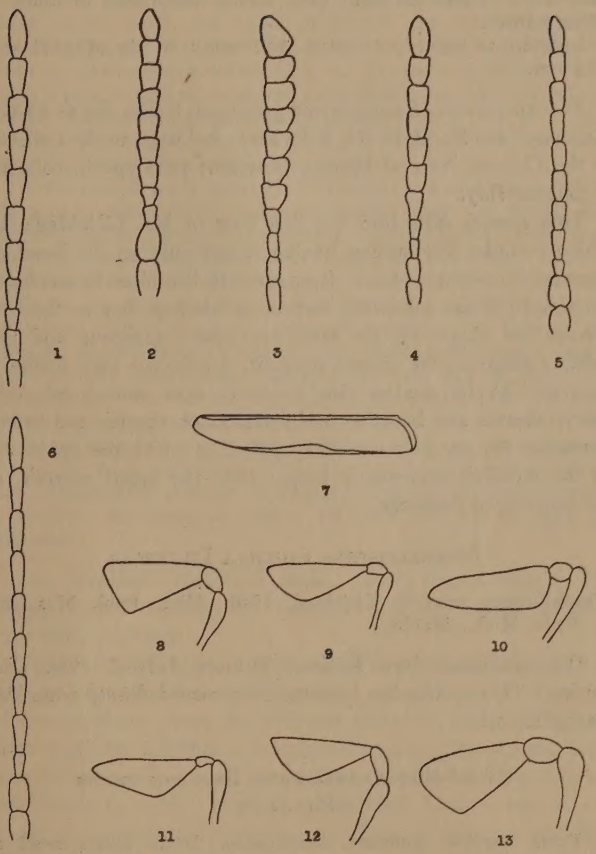

Fig. 1, Antenna of *Mordellistena yumae* Ray. Fig. 2, Antenna of *Mordellistena uniformis* Ray. Fig. 3, Antenna of *Mordella longipalpis* Ray. Fig. 4, Antenna of *Mordellistena idahoensis* Ray. Fig. 5, Antenna of *Mordellistena neofascia* Ray. Fig. 6, Antenna of *Mordellistena leonardi* Ray. Fig. 7, Elytron of *Mordellistena leonardi* Ray. Fig. 8, Maxillary palpus of *Mordellistena leonardi* Ray, Fig. 9, Maxillary palpus of *Mordellistena idahoensis* Ray. Fig 10, Maxillary palpus of *Mordella longipalpis* Ray. Fig. 11, Maxillary palpus of *Mordellistena uniformis* Ray. Fig. 12, Maxillary palpus of *Mordellistena yumae* Ray. Fig. 13, Maxillary palpus of *Mordellistena neofascia* Ray.

moderately robust on basal half, thence acuminate to apex, the latter pointed.

Length: to apices of elytra, 1.81 mm.; to tip of anal style, 2.38 mm.

Two specimens: *Holotype* and *paratype*, males, NILES CENTER, ILLINOIS, June 22, 1935 (H. S. Dybas); holotype in the collection of the Chicago Natural History Museum; paratype in collection of Eugene Ray.

This species falls into the first part of Mr. Liljeblad's key, which includes five species having ridges only on the basal segment of the posterior tarsi. It apparently lies close to *viridescens* Liljeblad[4] in the following section of his key, but in the latter species the ridges on the tarsi are more numerous and there exists a ridge on the second segment. *Uniformis* may further be separated by its smaller size, narrower eyes, unicolored pubescence, shorter and broader anal style, much shorter and broader antennae, the peculiar maxillary palpi, in which the apical edge of the terminal segment is longer than the mesal margin, and the unicolored antennae.

MORDELLISTENA PAUXILLA LILJEBLAD

Mordellistena pauxilla Liljeblad, 1946. Misc. Publ. Mus. Zool., Univ. Mich., 62:133.

One specimen: New Milford, Illinois, July 2, 1936 (Ross-Burks). This species has hitherto been recorded only from Palos Park, Illinois.

Mordellistena idahoensis Ray, new species
(Figs. 4, 9)

Form narrow, elongate, subcuneate. Derm black, head castaneous with a large, fuscous cloud at vertex, the spot reaching occiput but not eyes; anterior angles of pronotum broadly fusco-castaneous, the spot reaching apex but not base; antennae fuscous, basal segments somewhat lighter; anterior and intermediate femora, except at extreme apex, castaneous; maxillary palpi and tips of anterior and intermediate femora fuscocastaneous; hind legs fuscous. Surface densely covered with fine, short, recumbent pubescence, cinereous everywhere, except on light areas, where it partakes of ground color.

Head strongly convex, but little narrower than pronotum; eyes entire, densely covered with fine, short, erect hairs. Antennae .87

[4]Misc. Publ. Mus. Zool., Univ. Mich., 1946, 62:78.

mm. long, not reaching base of pronotum; segments 1-2 moderately large, equal; 3-4 equal in length, the latter but slightly broader at apex; 5-10 each two-thirds longer and one-half broader than 4, subserrate, broadest at apex; 11 one-half longer than 10, sides strongly curved, broadest premedially, angles rounded. Terminal segment of maxillary palpi enlarged, with form of a scalene triangle, apical side shortest, mesal and lateral margins almost straight, apical edge and angles rounded.

Pronotum strongly rounded, distinctly broader than long (.83 x .68 mm.), edges finely margined, apex, sides and basal angles rounded, latter obtuse, base arcuate, midbasal lobe broad, moderately produced, subtruncate in front of scutellum. Scutellum moderately large, broadly triangular, apex and sides rounded.

Elytra narrow, elongate, almost two and one-half times as long as broad (1.85 x .75 mm.), sides subcuneate from base to apex, strongly curved from middle to apex, apices individually rounded. Anterior and intermediate tarsi filiform, as long as their tibiae, penultimate segment shortest. Posterior tibiae with two short, oblique, equal, parallel ridges near tip (excluding subapical one); basitarsi with two short, oblique ridges near tip, second segment with one. Anal style three times length of hypopygium (.79 x .26 mm.), moderately slender, acuminate to apex, the latter truncate.

Length: to apices of elytra, 2.53 mm.; to tip of anal style, 3.32 mm.

One specimen: *Holotype*, male, CAREY, IDAHO, July 6, 1926, altitude 5,850 feet (R. W. Haegele); in the collection of the University of Idaho.

This species is most closely allied to *paradisa* Liljeblad[5] and may be separated by the larger size, broader terminal segment of the maxillary palpi, the different antennae, in which segments three and four together are longer than five, four a little longer than three and five to ten much broader, and by the following differences in color: pronotum bicolored (unicolored in *paradisa*), completely black venter, rufoflavous anterior and intermediate femora (the latter dark at apex), the rest black, the two basal segments of antennae rufoflavous, the other segments ranging from fuscous to black, and the black palpi. The elytra in this species are distinctly narrower at base than the pronotum.

MORDELLISTENA FULVICOLLIS (MELSHEIMER)

Mordella fulvicollis Melsheimer, 1846. Pr. Ac. N. S. Phila., 2:315.

One specimen: Temple Hill, Illinois, June 24, 1936 (DeLong-Ross).

[5]Misc. Publ. Mus. Zool., Univ. Mich., 1946, 62:94.

MORDELLISTENA RUBRIFASCIA LILJEBLAD

Mordellistena rubrifascia Liljeblad, 1946. Misc. Publ. Mus. Zool., Univ. Mich., 62:113.

Four specimens: all from Illinois: Elizabethtown, June 25, 1932 (Ross-Dozier-Park), White Heath, June 4, 1939 (J. C. Dirks), Princeton, June 28, 1932 (Ross-Burks) and Shawneetown, June 23, 1936 (DeLong-Ross).

Mordellistena neofascia Ray, new species
(Figs. 5, 13)

Form narrow, moderately elongate, sides subparallel. Derm black, head flavocastaneous, a large, obscure, fuscous cloud extending from anterior margin of the eye to the occiput; antennae flavocastaneous on basal three segments, thence darker distally—black at terminus; maxillary palpi castaneous; anterior femora and tibiae and intermediate femora castaneous, remainder of legs fuscous; apical margins of abdominal segments narrowly rufocastaneous. Surface densely covered with fine, short, recumbent pubescence, cinereous everywhere, except on light areas, where it partakes of ground color and on elytra, where it is mixed cinereous and yellowish-cinereous.

Head strongly convex, one-fifth narrower than pronotum; eyes entire, densely covered with fine, short, erect hairs. Antennae moderately long (.9 mm.), reaching base of pronotum; segments 1-2 large, latter somewhat longer; 4 twice as long and distinctly broader than 3; 5-10 each as long as 4 but distinctly broader; 11 oval, slightly longer than 10, broadest medially, sides and apex rounded. Terminal segment of maxillary palpi enlarged, with the form of a broad scalene triangle, apical edge shortest, sides and angles rounded.

Pronotum strongly convex, distinctly broader than long (.87 x .64 mm.), edges finely margined, apex, sides and basal angles rounded, latter obtuse, base arcuate, midbasal lobe broad, moderately produced, rounded in front of scutellum. Scutellum small, triangular, sides and apex rounded.

Elytra narrow, moderately elongate, two and one-third times as long as broad (2.11 x .87 mm.), sides subparallel on basal half, thence strongly curved to apex, apices individually rounded. Anterior and intermediate tarsi filiform, longer than their tibiae, penultimate segment the shortest. Posterior tibiae with two oblique, equal, parallel ridges (excluding subapical one); basitarsi with three oblique ridges, second segment with two. Anal style slightly more than twice length of hypopygium (.9 x .42 mm.), robust, acuminate to apex, latter subtruncate.

Length: to apices of elytra, 2.75 mm.; to tip of anal style, 3.65 mm.

One specimen: *Holotype*, male, WICKENBURG, ARIZONA, July 16, 1937 (D. J. and J. N. Knull); in the collection of Ohio State University.

This species is most closely allied to *rubrifascia* Liljeblad and may be separated by the bicolored elytral pubescence, the narrowly fuscocastaneous apical margins of the abdominal segments, the more robust anal style, the narrower body form and the peculiar antennae, with segment four two-thirds longer than three, the former as long and very little narrower than five, four to ten equal in length.

MORDELLISTENA INFIMA LECONTE

Mordellistena infima LeConte, 1862. Pr. Ac. N. S. Phila., 14:49.
Mordellistena tiara Ray, 1936, n. syn. Can. Ent., 68:127.

Scattered specimens received from various states east of the Mississippi River, Texas and Mexico during the past ten years indicates that *tiara* Ray is a synonym of this species.

Mordellistena yumae Ray, new species
(Figs. 1, 12)

Form narrow, subcuneate, sides parallel on basal half of elytra. Head flavocastaneous, with a vague, fuscous dorsal cloud on vertex; pronotum flavocastaneous, with a triangular fuscous or piceous area on basal half, extending almost to basal angles and anteriorly to middle of disc; elytra, meso- and metasternum and abdomen black; four basal segments of antennae flavocastaneous, the remainder fuscocastaneous; legs completely flavocastaneous; maxillary palpi flavocastaneous, except at tip of terminal segment, where it is fuscocastaneous. Surface densely covered with silvery white pubescence, most noticeable on the darker areas.

Head strongly convex, distinctly narrower than pronotum; eyes entire, rather densely covered with short, erect hairs. Antennae 1.06-1.4 mm. long, not reaching base of pronotum; segments 1-2 large, equal; 4 one-third longer than 3 and slightly broader; 5-10 each one-fourth longer than 4, 5 distinctly longer and broader than 4, 5-10 decreasing slightly in width distally; 11 one-fourth longer than 10, broadest postmedially, sides and angles rounded. Terminal segment of maxillary palpi enlarged, form of a broad, scalene triangle, apical side shortest, rounded, mesal and outer edges straight, angles rounded.

Pronotum distinctly broader than long (1.09-1.47 x .94-1.2 mm.), apex and sides broadly rounded, basal angles obtuse, base arcuate, midbasal lobe short, broad, rounded. Scutellum small, triangular, apex rounded.

Elytra from two and one-third to two and one-half times as long as broad (2.53-3.16 x 1.09-1.47 mm.), sides subparallel on basal half, thence curved to apex, apices individually rounded. Anterior and intermediate tarsi filiform, slightly longer than their tibiae. Posterior tibiae with two short, oblique, parallel ridges; basitarsi with three ridges (a rudiment of a fourth in the male paratype), second segment with one or two ridges. Anal style fairly robust, from two (female) to two and one-half (male) times length of hypopygium (1.1-1.2 x .4-.45 mm.), broad on basal half, thence attenuate to apex.

Length: to apices of elytra, 3.27-4.37 mm.; to tip of anal style, 4.33-5.43 mm.

Eleven specimens: *Holotype*, male, *allotype*, female, and two *paratypes*, YUMA, ARIZONA, May 3-5, 1918 (J. C. Bradley); five paratypes, FISH SPRINGS, CALIFORNIA, March 19, 1926 (F. E. Blaisdell); one paratype, INDEPENDENCE, INYO COUNTY, CALIFORNIA, June 14, 1929 (E. P. Van Duzee); one paratype, FORT YUMA, CALIFORNIA, August 21, 1924 (E. P. Van Duzee); holotype and allotype in the collection of Cornell University. Type No. 2263; paratypes in the collections of the California Academy of Sciences and Eugene Ray.

From its closest ally, *caliginosa* Liljeblad[6], this species may be separated by the distinct difference in color, including the triangular area on the basal half of pronotum, by the two ridges on the posterior tibiae (three in *caliginosa*), by the longer anal style, and by the broader terminal segment of the maxillary palpi.

Although this species has but two ridges on the posterior tibiae, because of its strong resemblance in form, structure and color to *caliginosa*, it should be placed close to the latter species in a systematic arrangement.

Mordellistena leonardi Ray, new species
(Figs. 6, 7, 8)

Form narrow, linear, sides subparallel to within a fifth of apices of elytra. Color fuscous brown, appendages flavous, except hind femora, which are fuscous brown; elytra flavous, middle half of base, suture and sides narrowly (broader at middle) fuscous brown; apical margins of abdominal segments narrowly flavobrunneous; extreme tip of anal style brunneous; eyes silvery white; surface densely covered with fine, recumbent pubescence, fuscocinereous on dark parts, flavobrunneous on lighter areas.

[6]Misc. Publ. Mus. Zool., Univ. Mich., 1946, 62:158.

Head strongly convex, distinctly narrower than pronotum; eyes entire, densely covered with moderately long, erect hairs. Antennae .96-1.17 mm. long, reaching base of pronotum; segment 2 distinctly longer than 1; 4 one-half longer than 3; 5-10 each one-third longer than 4 and slightly broader; 11 distinctly longer than 10, broadest postmedially, mesal edge and apex rounded, lateral margin straight. Terminal segment of maxillary palpi enlarged, form of a broad scalene triangle, apical side shortest, sides almost straight, angles rounded.

Pronotum as long as broad (.72-.87 mm.), finely margined, apex and sides broadly rounded, basal angles obtuse, base arcuate, mid-basal lobe short, broad, rounded. Scutellum small, subtriangular, apex broadly rounded.

Elytra two and two-thirds times as long as broad (2.08-2.57 x .72-.87 mm.), sides subparallel on basal four-fifths, thence curved to apex, apices individually rounded. Anterior and intermediate tarsi slightly longer than their tibiae; penultimate segment distinctly expanded at apex. Posterior tibiae with two short, oblique, parallel ridges; basitarsi with three ridges, the middle one somewhat shorter than the other two, second segment with two ridges. Anal style slender, more than two and one-half times length of hypopygium (.91-1.13 x .38-.45 mm.), attenuate to apex.

Length: to apices of elytra, 2.8-3.44 mm.; to tip of anal style, 3.71-4.57 mm.

Four specimens: *Holotype*, male, *allotype*, female, and a *paratype*, male, MICANOPY, ALACHUA COUNTY, FLORIDA, March 6, 1927 (M. D. Leonard); a female paratype, LUCEDALE, MISSISSIPPI, March 29, 1932 (H. Dietrich); holotype and allotype in the collection of Cornell University, Type No. 2264; paratypes in the collection of Eugene Ray.

From its closest ally, *egregia* Liljeblad[7], this species may be separated by the much shorter anal style, the darker meso and metasternum, dark femora, black head and pronotum, the uniformly yellow antennae, the narrower, more elongate form, the antennae, with the fourth segment but one-half longer than the third, and the much broader terminal segment of the maxillary palpi.

MORDELLISTENA BLATCHLEYI LILJEBLAD

Mordellistena blatchleyi Liljeblad, 1946. Misc. Publ. Mus. Zool., Univ. Mich., 62:133.

Five specimens: Fulton, Illinois, August 22, 1935, and Norris City, Illinois, June 24, 1936 (DeLong-Ross); Eddyville, Pope

[7] Ibid, 1946, 62:107.

County, Illinois, June 20, 1934 (E. Ray); Erie County, Ohio, August 20 (A. C. Miller); and St. Simons Island, Georgia, July 19, 1931 (C. A. Frost). These are all new records for this species, hitherto known only from Florida.

Mordellistena wickhami Liljeblad

Mordellistena wickhami Liljeblad, 1946. Ibid, 62:135.

One specimen: Palestine, Illinois, May 25, 1942 (Mohr-Burks). This species has hitherto been known only from Utah.

Mordellistena ruficeps LeConte

Mordellistena ruficeps LeConte, 1862. Pr. Ac. N. S. Phila., 14:50.

Three specimens: two from Fulton, Illinois, August 22, 1935, and one from Shawneetown, Illinois, June 23, 1936 (DeLong-Ross). These are the first Illinois records for this species.

Mordellistena floridensis Smith

Mordellistena floridensis Smith, 1882. Tr. Am. Ent. Soc., 10:95.

Five specimens: one, Gatlinburg, Tennessee, August 31-September 4, 1940 (B. D. Burks); four, Forest Hill, Rapides Parish, Louisiana, September 17-29, 1945, in light trap (R. L. Wenzel). This southern and western species has hitherto not been taken north of the Gulf States.

Mordellistena husseyi Liljeblad

Mordellistena husseyi Liljeblad, 1946. Misc. Publ. Mus. Zool., Univ. Mich., 62:176.

Twenty-three specimens: twenty from Fulton, Illinois, August 22, 1935 (DeLong-Ross), one each from Thomson, Illinois, August 16, 1937 (Ross-Burks), Norris City, Illinois, June 24, 1936 (DeLong-Ross) and Gatlinburg, Tennessee, August 31-September 4, 1940 (B. D. Burks). This species, described from Michigan, shows a considerable amount of variation in the matter of color and in the ridges on the posterior tibiae and tarsi. The color varies from almost completely black to specimens which have the head and pronotum fuscoferruginous and the front and middle legs testaceous. Other specimens have the front broadly castaneous, with the remainder of the head black. The tibial ridges

vary from three (excluding the subapical one), with the middle ridge extending completely across the outer face, to those with only two ridges—intermediate individuals have a rudimentary third ridge. In one specimen the long ridge extends only across two-thirds of the surface. The basitarsi have from three to five ridges, with the basal one in the latter case being rudimentary. The second always has two ridges.

From the series at hand it seems that *husseyi* is misplaced in its present position. It should appear after *rufa* Liljeblad in a systematic series.

Mordellistena smithi Dury

Mordellistena smithi Dury, 1906. J. Cinc. Soc. N. H., 20:177.

Two specimens: White Heath, Illinois, July 9 and 31, 1939 (J. C. Dirks). This species is now known from Maryland west to Illinois and southwest to Arkansas.

Mordellistena sericans Fall

Mordellistena sericans Fall, 1907. Tr. Am. Ent. Soc., 33:256.

Four specimens: (2) Fox Lake, Illinois, June 10, 1936 (Ross-Burks); White Heath, Illinois, June 13, 1939 (J. C. Dirks) and Havena, Illinois, May 27, 1936 (Mohr-Burks).

These are the northernmost records for this species, here listed for the first time as occurring in Illinois.

Mordellistena vera Liljeblad

Mordellistena vera Liljeblad, 1917. Can. Ent., 49:11.

One specimen: White Heath, Illinois, July 9 (J. C. Dirks).

Pentaria bicolor (Liljeblad)

Anthobates bicolor Liljeblad, 1918. Can. Ent., 50:155.

One specimen: Midland, Colorado, August 8, 1943 (H. H. Ross).

Pentaria fuscula LeConte

Pentaria fuscula LeConte, 1862. Pr. Ac. N. S. Phila., 14:44.

Twenty-two specimens: from the following Colorado localities: Midland, along Four Mile Creek, Woodland Park, Green

Mountain Falls, and Rampart Range Road, Cascade, August 2-10 (H. H. Ross). These are new Colorado records for this western form.

PENTARIA BICINCTA CHAMPION

Pentaria bicincta Champion, 1891. Biol. Centr. Am. Col., 4, 2:254.

Two specimens: Dallas County, Texas, June 6 and 11, 1938 (R. E. Maxwell). Originally described from Chihuahua, the above record is the northernmost for this species.

PENTARIA DECOLOR CHAMPION

Pentaria decolor Champion. Ibid, 256.

One specimen: Neville Spring near Chisos Mountain Park, Texas, April 18, 1939 (H. H. Ross). This record is an addition to the United States list, since *decolor* has hitherto been known only from Sonora and other Mexican localities.

A NEW WEEVIL RECORD FOR NEVADA

(Coleoptera, Curculionidae)

Cryptorhynchus lapathi (L). Washoe County (*Truckee Meadows*, 8/IX/40, 19/III/41, 3/VIII/41, 27/IX/41, el. 4,500 ft. —LaR). This cosmopolitan willow gall-former has long been known in the United States, but this is the first record for Nevada, although it has been established on the Pacific Coast for some time. It is now common locally about Reno, where the large willow population affords it ready hosts. Willows have long been a dominant plant along the few stream courses in Nevada, and have a large parasitic entourage of gall-forming Lepidoptera, Diptera and Hymenoptera; *lapathi* must now be added as a rapidly-developing major pest of the plants, its abundance attested by the readiness with which adults are collected in the field. As yet, no official recognition of its presence has been taken, and it may become a problem in the future.—IRA LA RIVERS.

A NEW SPECIES OF RHODESIELLA FROM GUAM
(Diptera, Chloropidae)

BY CURTIS W. SABROSKY

Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture

In a small series of Chloropidae from Guam, submitted to me for determination by G. E. Bohart, was an undescribed species of *Rhodesiella* Adams. The genus ranges in a number of species through the Ethiopian and Indo-Australian regions. The present species appears almost identical with *R. macgregori* (Malloch) from the Philippines, but can be distinguished by the striking development of the male genitalia.

Rhodesiella boharti Sabrosky, new species

A species of the *tarsalis* group, with elongate scutellum, black femora and tibiae, blue-black frontal triangle with nearly acute apex, and the ultimate section of the fourth vein ($= R_{4+5}$) straight.

♂, ♀. Predominantly black, only the basal two-thirds of the third antennal segment, the stalks of the halteres, the trochanters, ends of the tibiae narrowly, and the basal segments of the tarsi, yellow. Frontal triangle polished, dark bluish black, the apex narrowly rounded at the anterior margin of the front and not truncate as in *normalis* Malloch and *scutellata* de Meijere. The distinctly pubescent arista is long, its length subequal to the height of the head.

Mesonotum shining black, rather thickly beset with short, pale hairs, slightly wider than long (as 58:55), its length nearly twice that of the scutellum (55:30). The latter appears elongate conical, its length slightly greater than its basal width, with a pair of long apical and one pair of short subapical scutellar bristles. Fore tarsi with the three distal segments black, the second light brown; middle and hind tarsi with only the apical segment black, the fourth light brown. Femora not greatly enlarged, the hind pair without short spines or teeth on the ventral side near the base.

Wings with the ultimate section of the fourth vein practically straight, very slightly curved basally; the second and third veins slightly concave anteriorly, third costal sector one and one-quarter times the second sector.

Male genitalia larger than usual in the genus, shining black, each half of the hypopygium with a long curving prolongation which extends ventrocephalad along the underside of the abdomen at rest, and which has 15 to 16 long black setae radiating from the apical portion, each seta as long as the hypopygium itself and sinuate at the tip. The dorsal part of each half of the hypopygium bears on its mesal margin a forwardly directed black bristle, fully as long as the terminal setae but much stronger, as well as a row of long but weaker setae extending along the inner margin of the prolongation from the mesal bristle nearly to the curling apex with its long radiating setae. At rest, without the genitalia extended, the numerous long bristles appear as a complex network beneath the abdomen, quite unlike *R. macgregori* which is otherwise very similar to the present species.

Length, 2-2.5 mm.

Holotype, male, PILGO RIVER, GUAM, May 26, 1945. *Allotype*, near POINT MANELL, GUAM, May 19, 1945. *Paratypes*, male, same data as allotype; male, POINT OCA, GUAM, May 7, 1945; female, Point Oca, Guam, May 20, 1945, on dead mollusks; five males, six females, Point Oca, Guam, May, 1945, in light trap. All collected by G. E. Bohart and J. L. Gressitt. Type and allotype deposited in the United States National Museum, No. 58002.

In Malloch's synopsis of the genus (1931, Ann. and Mag. Nat. Hist., ser. 10, 8: 49-69), the species will run to *macgregori* Malloch, described from a lone specimen from Manila in the Philippines. From the description alone, it would be impossible to separate the present specimens, but a study of the type of the former has confirmed the validity of the species from Guam.

The holotype of *macgregori*—fortunately a male—had been mounted from fluid and was not deeply colored. It seems quite probable that in life the tibiae were more extensively infuscated than was indicated in Malloch's description. There is also a strong suggestion that the tarsi were not "entirely yellow," as described, but that the apical segments were brown to blackish, probably the same segments as described above for *R. boharti*. The male genitalia proved to be relatively small and inconspicuous in the type of *macgregori*, with the small hypopygium not prolonged and not bearing unusually long setae.

AN ANNOTATED LIST OF THE CICINDELIDAE KNOWN TO OCCUR IN NEVADA

(Coleoptera)

BY IRA LA RIVERS
University of California, Berkeley, California

The only group of this family known to occur in Nevada are representatives of the massive genus *Cicindela* L. 1758. Fourteen species and eight subspecies of the genus, which is represented in the continental United States by over 100 species and many varieties, have been found in the State.

I am indebted to Mont A. Cazier for most of the determinations.

Cicindelini

1. *Cicindela purpurea graminea* Schaupp 1883. Washoe County (*Truckee Meadows*, 18 IV/40, 16/III/41, el. 4.500 ft.—LaR). This is a midwest form which will undoubtedly be found in eastern Nevada also. Collection data in the vicinity of Reno indicate it to be an early spring form. No previous records.

2. *Cicindela limbalis* Klug 1934. I have no specimens of this. W. Horn (1915) listed Nevada, New Mexico, Kentucky, Ohio, Colorado, New Jersey, and Manitoba for *limbalis* as a form of *purpurea*.

3. *Cicindela tranquebarica borealis* Harris 1911. Washoe County (*Truckee Meadows*, 17/IV/40, 16/III/41, el. 4.500 ft.—LaR). Primarily a northwest form extending into Nevada, and another early spring variety. Members of this complex in Nevada are habitués of alkaline and semi-alkaline areas. The most populous colony known to me in the Truckee Meadows is located on a stretch of semi-alkaline ground lying partially in foothill brushland and partially in irrigated pasture land on the eastern edge of the Meadows, the central portion of which is strongly overgrown in saltgrass, bordered with *Chrysothamnus nauseosum*. Here *borealis* is common, while *kirbyi* is occasionally taken. *Borealis* larval burrows are generally constructed in the saltgrass along ditches, but adults commonly frequent the open clearings of alkaline aspect which lie adjacent to the grassland. No previous records.

——*Cicindela tranquebarica kirbyi* LeConte 1866. Churchill County (*Little Soda Lake*, near Fallon, 19/V/40, el. 4,000 ft.—LaR); Washoe County (*Truckee Meadows*, 23/III/41, el. 4,500 ft.—LaR). No previous records.

——*Cicindela tranquebarica owena* Fall 1917. Churchill County (*Little Soda Lake*, near Fallon, 19/V/40, el. 4,000 ft.—LaR). *Kirbyi* and *owena* were taken about the circumference of several of the tiny alkaline pools in the neighborhood of Little Soda Lake, where both larvae and imagines were common during the summer months. Many of these pools are in the nature of playas, and contain water only during the winter and spring months. Generally they are so alkaline as to preclude aquatic insects, and are inhabited only by the brine shrimp, *Artemia salina*, and other phyllopods. *Owena* was originally described from Olancha, Owen's Valley, California, and seems to have worked into the Great Basin up the Sonoran Trailway (see *carthagena hemorrhagica*). No previous records.

——*Cicindela tranquebarica propinqua* Knaus 1922. Nye County (*Ash Meadows*, 16/VIII/21, el. 2.050 ft.—W. Knaus). This is the type locality, and the form was described from a solitary male. Knaus says: "On margin of mud stream. No other specimens seen in five days collecting." Knaus described it as a variety of *denverensis* Casey, and reported it associated with *nevadica*, *hemorrhagica* and *tenuisignata*. I have no specimens.

4. *Cicindela vibex* Horn 1886. In 1914, Col. Casey described *parallelonota* based on a single female from Las Vegas, Clark County, Nevada, which has since been relegated to the synonymy of *vibex*. I have not seen the species in Nevada.

——*Cicindela vibex moapana* Casey 1914. Casey's type was a single female from McGill, White Pine County, Nevada, taken at 6,500 ft. elevation. I do not have the form.

5. *Cicindela plutonica leachi* Cazier 1936. Washoe County (*Truckee Meadows*, III/40, 22/IV/41, el. 4,500 ft.—LaR). This beautiful brilliant blue-green form appears early, and unlike the *tranquebaricae*, seems only to be in evidence during the spring, disappearing to unknown areas during summer and fall. It must be classed as rare in the State, for I have never managed to flush more than a dozen specimens during total spring collecting; fortunately, these are always readily conspicuous among the other *Cicindela*, being larger and more brilliant, and can be followed

for some distance before being lost. *Leachi* is found in the same alkaline area as that of the *tranquebaricae* discussed above. W. Horn (1915) listed California, Oregon, Idaho and Nevada as the range for *tranquebarica plutonica* Casey, and Cazier (1936A) mentions a specimen of typical *plutonica* for "Nevada" in the same paper in which he describes *leachi*. The latter's type locality is given as 9,000–10,000 ft. in the Warner Mountains, Modoc County, California, and the same elevation is listed for *plutonica;* however, the habitat of *leachi* in Nevada is quite different, 4,500 ft. being its best known elevation, while its typical environment of semi-alkaline aspect is in contrast to its observed preferences at higher altitudes where it seems to inhabit more frigid environs on open, exposed slopes. On the other hand, the contrast in habitats is lessened when it is remembered that *leachi* is confined to the cooler portion of the spring months in Nevada and that as such it cannot be classed as a characteristic element of semi-alkaline environs even while breeding there, for it leaves before hot weather sets in. No previous records.

6. *Cicindela longilabris* Say 1824. Elko County (*Ruby Mountains*, Lamoille Canon, 25 VI 41, el. 7,000 ft.—LaR and G. C. Christensen). This distinctive black species was seen only once along the upper, frigid reaches of Thomas Creek near the snow-containing cirque at the head of Lamoille Canon, where its environment is that of a forest-clearing inhabitant of montane aspect. No previous records.

——*Cicindela longilabris oslari* Leng 1902. Originally described from a 9,500 ft. altitude in Colorado, this form is reported from Nevada in the Leng (1920) catalog, but I have been unable to locate the original reference. Leng says of it that its flight is heavy, slow and weak, and it seems to prefer running to flying. I have not seen it.

7. *Cicindela oregona* LeConte 1857. Elko County (*Elko,* 24/VII/39, el. 5,000 ft.—LaR); Washoe County (*Truckee Meadows,* 29/V/39, 16/X/39, el. 4,500 feet.—LaR). This is the most widespread species in the West, and occurs over the entire state of Nevada. I am familiar wiith it in all situations except dense timber. On many occasions it is found living beside small springs in the desert, seepage from which sinks into the ground a few yards from its source, and located miles from the nearest permanent stream or lake. In such situations, where the sanded beach may be only a few square feet, the ground is often riddled

with larval burrows, and the adults are like flies hunting on the sand. LeConte described it from northern California and Oregon specimens.

8. *Cicindela senilis* Horn 1866. Schaupp (1883) listed the species from "California (San Diego), Nevada and Utah." I do not have it.

9. *Cicindela willistoni echo* Casey 1897. Churchill County (*Little Soda Lake*, near Fallon, 19/V/40, el. 4,000 ft.—LaR); Washoe County (*Gerlach*, 29/V/39, el. 4,000 ft.—P. C. Ting, M. A. Cazier, J. A. Downes, T. Aiken). Cazier (1936B) recorded it from Churchill-Pershing Counties (*Humboldt Lake*—H. F. Wickham).

——*Cicindela willistoni pseudosenilis* W. Horn 1900. Churchill-Pershing Counties (*Humboldt Lake*—H. F. Wickham) fide Cazier (1936B). I have no specimens.

——*Cicindela willistoni amargosae* Dahl 1939. Washoe County (*Gerlach*, 29/V/39, el. 4,000 ft.—P. C. Ting, M. A. Cazier, J. A. Downes, T. Aiken; *Truckee Meadows*, 12/X/39, 13/IV/41, el. 4,500 ft.—LaR). Like the *tranquebaricae*, the *willistoni* group inhabits alkaline desert areas, often in considerable numbers, and shows striking differences in maculation and color-phasing, varying from the well-maculate *echo* and *pseudosenilis* to the nearly immaculate greenish-to-black *amargosae*. The last mentioned form is the commonest *Cicindela* in the collecting area discussed under *tranquebarica·borealis*, and can be taken in any numbers through spring and summer. Its Nevada distribution has been previously discussed by Dahl (1940), who described it on the basis of a large series from near Furnace Creek, Death Valley, Inyo County, California, where it was found along saline pools associated with *pseudosenilis*.

10. *Cicindela parowana* Wickham 1905. Washoe County (*Truckee Meadows*, 23-30/III/41, 13/IV/41, 4/VIII/41, el. 4,500 ft.—LaR). A trim, strongly-maculate species, not uncommon about Reno. For some time *parowana* was considered a subspecies of *fulgida*, but Cazier (1936B) felt it deserved specific status as originally described by Wickham and came to the conclusion that no true *fulgida* exists in the Great Basin. Wickham described it from a small series taken "on the old sand beaches of Little Salt Lake, near Parowan, Utah." I know of no previous records.

11. *Cicindela tenuisignata* LeConte 1851. This is included in the State fauna on the basis of Knaus' (1922) mention of it as

being associated with *tranquebarica propinqua* in southern Nevada, Nye County (*Ash Meadows,* 16/VIII/21, el. 2,050 ft.—W. Knaus). LeConte knew it from Arizona, southern California, Texas and Mexico. I have not seen it.

12. *Cicindela carthagena hemorrhagica* LeConte 1851. Clark County (*Las Vegas,* 16/VI/37, el. 2,000 ft.—LaR and N. Hancock); Mineral County (*Walker Lake,* 7/VI/41, el. 4,050 ft.—LaR and G. C. Christensen); Washoe County (*Pyramid Lake,* 16/VIII/41, el. 3,900 ft.—LaR, T. Trelease and G. C. Christensen; *Truckee Meadows,* 17/XI/39, el. 4,500 ft.—LaR). This is essentially a southern form in Nevada, being very common about small springs and water sources in alkaline areas, and while numerous in such situations, is often the only *Cicindela* present. It is quite characteristic of a biological area known as the Sonoran Trailway which enters Nevada from the southwest, and through which species of many phyla seem obviously to have gained entry into the State from more subtropical regions to the south. Included among these are certain lizards, rodents, scorpions and many insects.

G. Horn (1876) says *hemorrhagica* "occurs on the sea coast of southwest California, extending thence in a northeasterly direction to Owen's Valley, and following the extensions of the Mojave Desert, reaches Nevada, and finally the headwaters of the Yellowstone." Schaupp (1883) listed it from Southern California, Nevada and Utah, and Leng (1902) mentioned Nevada. It seems to have been one of the most commonly-collected forms in the State. LeConte originally described it from San Diego, California. While serving as Surgeon of California Volunteers in the middle 1860's, Dr. George Horn knew it from Owen's Valley, and made what is now merely an interesting comment that "it is remarkable that a species hitherto found only on the sea coast at San Diego, should occur so far inland."

——*Cicindela carthagena pacifica* Schaupp 1883. Clark County (*Las Vegas,* 16/VI/37, el. 2,000 ft.—LaR and N. Hancock). W. Horn (1915) listed southern California, Nevada and Utah for this variety. In 1924, Casey based *nevadiana* on two specimens collected by Spalding at Las Vegas (Clark County), Nevada, a name which has since fallen under the synonymy of *pacifica.* The *carthagenae,* like two previously-discussed groups (see above) is an arid-alkaline series, *pacifica* apparently being restricted to extreme southern Nevada, while *hemorrhagica* is

more widespread. While *carthagena, willistoni* and *tranquebarica* are often found associated, I have not found the association marked in the Truckee Meadows localities. In the Meadows, a small alkaline spot at the south edge has been most productive of *carthagena*, with little else but *oregona* present, while the previously-mentioned eastern locale (see *tranquebarica borealis*) has not yielded it.

13. *Cicindela pusilla imperfecta* LeConte 1851. Elko County (*Elko*, 11/VI/39, el. 5,000 ft.—LaR); Washoe County (*Truckee Meadows*, 14/VII/40, el. 4,500 ft.—LaR). This is a small, delicately-maculated form which is quite rare in Nevada, although distributed through most of the Western States. Schaupp (1883) had California, Oregon and Nevada for the range. LeConte originally described it from "California borealis."

14. *Cicindela nevadica* LeConte 1875. In his description, LeConte has "Nevada, Mr. E. P. Austin." Schaupp, of course, followed LeConte (1883) and in 1902, Leng commented that it had "not recently been collected." W. Horn (1915) reported the range as Nevada to Nebraska. I do not have the species.

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LOUIS S. SLEVIN

Louis Stanislaus Slevin, a well-known collector of California insects, was accidentally killed on November 9, 1945. He was born on November 7, 1879, in San Francisco and was educated at Saint Ignatius College. Being a member of a family of collectors and hobbyists, it is not surprising that with his two brothers he began his insect collecting career at the early age of nine. The family's summer vacations at Wright's in the Santa Cruz Mountains provided ample opportunities for the young naturalists.

In 1904 he and his mother moved to Carmel-by-the-Sea and established a stationery and art supplies store which he maintained until the last few years of his life. During the years at Carmel he took advantage of the fine insect collecting opportunities thereabouts and in the nearby Santa Lucia Mountains. His fine collection, amounting to some 30,000 specimens, was donated to the California Academy of Sciences in 1927. He continued to collect, however, sending material to the Academy until forced to discontinue his activities due to failing health.

He also was a nationally-known collector of historic photographs on maritime subjects, ships' figureheads, locomotives, street cars, Old California adobes, and San Francisco. He is survived by his brother, Joseph R. Slevin, Curator of Reptiles at the California Academy of Sciences.—E. S. Ross.

SOME NEW SPECIES OF MALTHODES
(Coleoptera, Cantharidae)

BY KENNETH FENDER
McMinnville, Oregon

The members of the genus *Malthodes* have been neglected by North American coleopterists. The reason for this neglect is scarcely comprehensible. The males of *Malthodes* possess sexual characteristics of the terminal abdominal segments that present almost limitless variations. Three such variations are here offered as new.

Malthodes frisoni Fender, new species

Male. Head dark brown, shining, very finely sparsely punctate, wider than the thorax. Antennae as long as the body, the second and third antennal segments equal in length, the fourth segment about one-fifth longer, intermediate segments about four times as long as wide. Thorax yellow, shining, very finely sparsely punctate, transverse, anterior angles rounded, the sides straight, converging to the hind angles which are prominent. Elytra olivaceous, shining, sparsely punctate and rather feebly rugose. Pubescence ashy, fine and sparse. Underside brownish, thorax beneath, femora, basal half of tibiae of front legs and terminal segments of abdomen yellowish with a tendency to become infuscated. Length 3.5 to 4 mm.

Female. Similar to the male but with head slightly narrower than the thorax, antennal segments shorter and the terminal abdominal segments not pale. Length 3.5 to 4 mm.

Male sexual characters. Penultimate ventral convex and inflated, enveloping the sides of the penultimate dorsal, deeply emarginate behind, the emargination being rather evenly rounded. Last ventral stout, elongate, broadly and rather shallowly notched as viewed ventrally. In profile the last ventral is feebly sinuate and slightly notched at the tips. Last dorsal short, shallowly, angularly emarginate (figs. 1 and 2).

Holotype, male, *allotype*, female, and four *paratypes*, CHARLESTON, ILLINOIS, May 29, 1937, collected by Frison and Burke; two paratypes, FOUNTAIN BLUFF, ILLINOIS, May 7, 1925, collected by Frison; three paratypes, HEMSTEAD COUNTY, ARKANSAS, May 10, 1939. Single paratypes from the following localities and dates: OAKWOOD, ILLINOIS, May 24, 1926, Frison and Auden; Oakwood

Illinois, June 2, 1927, Frison; Oakwood, Illinois, June 6, 1924, Frison; MUNCIE, ILLINOIS, June 8, 1927, T. F. and A. G., SAINT JOSEPH, ILLINOIS, June 9, 1912.

This species and *Malthodes concavus* LeC. are isolated from the other known North American species by the convex, inflated penultimate ventral segments of the males. The last ventral segment of *M. concavus* is a narrow obliquely ascending process. This process is stout and feebly sinuate in *M. frisoni.* I dedicate this species to its main collector.

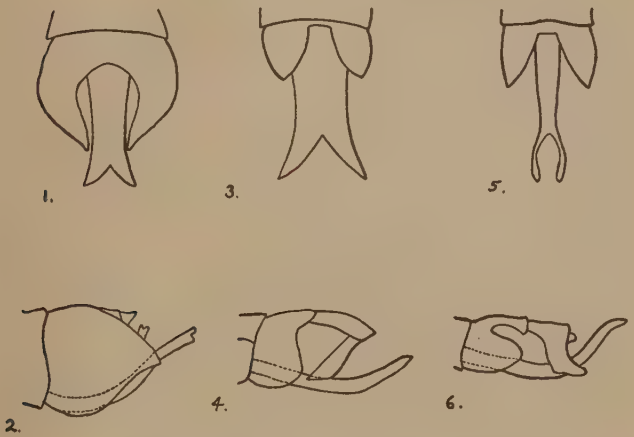

Fig. 1. Ventral view of terminal ventral abdominal segments of *Malthodes frisoni,* n. sp. Fig. 2. Lateral view of terminal abdominal segments of *M. frisoni,* n. sp. Figs. 3 and 4. Same of *Malthodes rotgeri,* n. sp. Figs. 5 and 6. Same of *Malthodes macnabi,* n. sp.

Malthodes rotgeri Fender, new species

Male. Black, posterior margin of pronotum very narrowly and terminal segments of the abdomen pale. Head shining, finely sparsely punctate, rather small, scarcely wider than the thorax. Antennae close together, the antennal tubercles with the inner sides forming a V-shaped notch on the front; second segment shorter than the third, third segment shorter than the fourth; intermediate segments about four times as long as wide. Pronotum finely sparsely punctate, the anterior angles rounded, the

side margins converging slightly to the hind angles which are obtusely rounded into the basal margin. Length 4 mm.

Female unknown.

Male sexual characters. Penultimate ventral segment widely deeply emarginate, the bottom of the emargination truncate. Last ventral stout and furcate, the tines of the furcation strongly divergent. In profile, the last ventral is curved up at the apical third. Last dorsal elongate, in repose projecting downward and toward the head, the tip broadly notched (figs. 3 and 4).

Holotype, male, and one male *paratype*, PAGOSA SPRINGS, COLORADO, June 17, 1940, collected by Rev. Bernard Rotger C. R. for whom it is named.

This species is unique in its elongate, downward and forward projecting last dorsal.

Malthodes macnabi Fender, new species

Male. Black, last two dorsal, last ventral and emargination of the penultimate ventral segments pale. Head shining, finely sparsely punctate, wider than the thorax. Antennal segments two and three subequal, each about three-fourths as long as the fourth, intermediate segments about four times as long as wide. Pronotum transverse, finely sparsely punctate, the front angles obliquely subtruncate, deflexed, side margins convergent from the anterior angles, slightly sinuate, hind angles obtuse. Length 3 to 3.5 mm.

Female. Black with last dorsal abdominal segment pale. In a few specimens the pronotum is paler toward the sides. Head and thorax equal in width, antennae shorter, intermediate segments about three times as long as wide. Length 3 to 3.5 mm.

Male sexual characters. Penultimate ventral widely deeply emarginate, the emargination truncate at the bottom; seventh ventral slender, elongate and widely, deeply furcate, the tines of the furcations slightly swollen apically. In profile, the apical half of the seventh ventral ascending, the ascending portion sinuate; side pieces of the last dorsal descending and projecting backward in a foot-shaped process; the terminus of the last dorsal with a short, ventrally and posteriorly directed median lobe (figs. 5 and 6).

Holotype, male, *allotype*, female, and 25 *paratypes*, LEWIS PEAK, BLUE MOUNTAINS, WASH., June 20, 1941, collected by D. M. and K. M. Fender.

It gives me great pleasure to dedicate this interesting little species to Dr. James A. Macnab with whom I have been closely associated for many years. This species is nearest *Malthodes frosti* Fender but can be readily separated from that species by the color of the thorax, widely emarginate penultimate ventral and the shape of the side pieces of the last dorsal.

A NEW CENTIPED AND TWO NEW MILLIPEDS FROM THE PEARL ISLANDS, COLOMBIA

BY RALPH V. CHAMBERLIN
University of Utah, Salt Lake City

In a small collection of centipeds and millipeds made by Dr. Robert C. Murphy upon San Jose in the Pearl Islands group, located in the Bay of Panama, are representatives of four species of which three here described are new. In addition to the specimens of the new forms there was an example of the chilopod *Cupipes ungulatus* (Meinert). The types of the new species are in the American Museum of Natural History.

CHILOPODA

Pselliodes margarites Chamberlin, new species

The dorsum chocolate colored with a narrow median longitudinal yellow or pale orange stripe, the orange tinge more pronounced on the saddles and the color lighter along margins in front of saddles; the median stripe narrower across and down front of head, a narrow light branch diverging obliquely cephaloectad to run along inner margin of eye and then forward. On some of the tergites a few light submarginal flecks on each side. Femora of legs with three chocolate colored annuli which are incomplete above, the annulus at distal end narrow. Tibia with two broad annuli and a very narrow annulus at each end. Metatarsi chocolate colored excepting a submedian light annulus and one at distal end. Tarsi of anterior legs with first division dark, with narrow light annuli at articulations of segments, the distal division light; on posterior legs the entire tarsi more or less light.

First flagellum of antennae typically with 78 articles, the second with above 170, the tips in the types being broken off.

First tarsus of first legs composed of 16 articles, the second of about 45. First tarsus of second legs with 17 articles, the second with 45. First tarsus of eighth legs composed of 11 articles, the second of about 42.

The caudal margin of the anterior stoma-bearing tergites widely and but moderately incurved, but that, e.g. of the sixth tergite, more narrowly and acutely excavated, with stoma projecting into the excavation. Last tergite with caudal margin rounded, flattened or straight in middle region.

The proximal articles of the female gonopods long and cylindrical, sub-parallel or with inner distal angles nearly touching; each bearing at its disto-mesal angle a conspicuous patch of short stiff setae; distal articles or claws broken off in the holotype.

Length, about 23 mm.

Locality. PEARL ISLANDS: SAN JOSE ID. One specimen taken by Dr. R. C. Murphy (No. 7757).

Chondrodesmus murphyi Chamberlin, n. sp. Tenth right keel.

Somewhat suggesting the Colombian *P. colombiana* Chamberlin. Aside from differences in details of color pattern, it may be distinguished by the differences in the posterior margins of the tergites, the excavations on the sixth tergite, for example, being obviously deeper and more acute with the stoma projecting into the excavation instead of being free from it.

DIPLOPODA

Diaporus margarites Chamberlin, new species

General color brown, with narrow darker annuli more distinct above. Legs yellow of a slightly ferruginous cast.

A median sulcus across vertex joining the usual fine impressed line running between the eyes. Frontal and clypeal areas of head smooth. Eyes with inner angle acute; separated by more than the long diameter.

Collum with lower ends abruptly inflected below a thickened, cariniform ridge, the inflected portion crossed by several (2 or 3) sharply impressed longitudinal sulci.

Tergites above densely punctate, crossed by fine striae below level of pores. The anal tergite moderately depressed transversely in front of the rounded posterior middle process, no tuberculiform process being set off.

The last ventral plate wide from side to side but short in the cephalocaudal direction, the anterior margin over the middle part gently convex, not at all angled, the curved lateral ends slenderly acute.

Number of segments, 56.

Diameter, 4 mm.

Locality. PEARL ISLANDS: SAN JOSE, ID. Two females taken by Dr. R. C. Murphy.

In general features apparently related to *D. chiriquensis* (Pocock) of Panama (Volcan de Chiriqui), but a smaller form in which the lower ends of the collum are much less strongly inflected.

Chondrodesmus murphyi, Chamberlin, new species

Dorsum brown or light chestnut of a somewhat pink tinge: a median longitudinal line and the keels light. Legs light yellow or nearly white in the holotype.

Dorsum strongly convex with the keels low down. Dorsal surface of tergites roughened with coriaceous lines and markings but without series of definite tubercles.

Keels obviously less than half the width of the dorsum. Keels of second and third segments shorter than those of fourth and fifth, their posterior angles subrectangular. Angles of subsequent keels a little produced. Those of 17th and 18th much more strongly produced. Posterior margins of keels of second, third and fourth with a slight, low and obtuse tooth. Posterior margin of fifth keel with a single well developed tooth, that of following keels with two teeth, or on some with a third tooth adjacent to the outer angle as shown in the figure which also shows the form of the pore swelling.

Length, 42 mm.; width, 9 mm.

Locality. PEARL ISLANDS: SAN JOSE, ID. One female taken by Dr. R. C. Murphy (No. 7105).

This form seems quite distinct from related Central American species in the size and form of the keels and in the teeth on the caudal margins of these.

MOSQUITO RECORDS FROM IDAHO

BY FRED C. HARMSTON
Assist. Sanitarian (R), U. S. Public Health Service, and
DON M. REES
University of Utah

This report is based on a study of the mosquitoes taken in Idaho by personnel of the U. S. Public Health Service, Malaria Control in War Areas, and specimens in the insect collections of the University of Utah and the Utah State Agricultural College. The study may be considered as preliminary, since collections have not been made in all parts of the state. However, it is believed that the material examined has been sufficient to give a rather accurate index to the mosquito fauna of Idaho. In attempting to make the lists as complete as possible all additional records from the works of Dyar, and others that have come to the attention of the writers, have been included.

The specimens examined were collected by means of a portable light trap; by hand while feeding; in a sweeping net; in resting shelters; and a few were reared from larvae. In this report the collection records are arranged alphabetically by county.

The writers are indebted to Dr. G. F. Knowlton, Utah State Agricultural College, and to personnel of the State of Idaho Department of Public Health for providing a number of records. Unless otherwise indicated collections were by L. E. Perry, or F. C. Harmston, U. S. Public Health Service.

List of Species Recorded

1. *Aedes campestris* Dyar & Knab.
2. *Aedes canadensis* (Theobald).
3. *Aedes cataphylla* Dyar.
4. *Aedes cinereus* Meigen.
5. *Aedes dorsalis* (Meigen).
6. *Aedes excrucians* (Walker).
7. *Aedes fitchii* (Felt & Young).
8. *Aedes flavescens* (Müller).
9. *Aedes idahoensis* (Theobald).
10. *Aedes increpitus* Dyar.
11. *Aedes lateralis* (Meigen).
12. *Aedes nigromaculis* (Ludlow).
13. *Aedes niphadopsis* Dyar & Knab.
14. *Aedes pullatus* (Coquillett).
15. *Aedes sticticus* (Meigen).
16. *Aedes stimulans* (Walker).
17. *Aedes triseriatus* (Say).

18. *Aedes trivittatus* (Coquillett).
19. *Aedes vexans* (Meigen).
20. *Culex apicalis* Adams.
21. *Culex erythrothorax* Dyar.
22. *Culex pipiens* Linnaeus.
23. *Culex restuans* Theobald.
24. *Culex salinarius* Coquillett.
25. *Culex tarsalis* Coquillett.
26. *Culiseta impatiens* (Walker).
27. *Culiseta incidens* (Thomson).
28. *Culiseta inornata* (Williston).
29. *Culiseta morsitans* (Theobald).
30. *Anopheles freeborni* Aitken
31. *Anopheles occidentalis* Dyar & Knab.
32. *Anopheles punctipennis* (Say).

Aedes campestris Dyar and Knab

This mosquito was observed in greatest abundance in the southeastern section of the state, particularly in areas where alkaline pools are present. Collections made near Burley and Boise indicate a rather wide distribution of this species across the southern half of the state, wherever suitable breeding places occur. It is an early-season, one-brooded species, appearing in greatest abundance during June.

Ada County: Boise, June 28, 1495. Bannock County: Arimo and Swan Lake, June 29, 1945. Bear Lake County: Bear Lake, June 1, 1929 (W. J. Gertsch); Fish Haven, June 1, 1930 (Rees); Paris, June 2, 1930 (Rees). Butte County: Arco, June 9, 1938 (Rees). Cassia County: Burley and Malta, June 26, 1945. Franklin County: Preston, July 2, 1934 (Rees). Oneida County: Malad, May 7, 1934 (Rees). Twin Falls County: Twin Falls, May 5, 1934 (Rees).

Aedes canadensis (Theobald)

This species was collected in the southwestern part of the state, in wooded areas along the larger streams.

Canyon County: Caldwell and Nampa, June 27, 1945. Gem County: Emmett, June 26, 1945.

Aedes cataphylla Dyar

To date this species has been collected only in the eastern half of the state, in or near the mountains, but it undoubtedly occurs in other parts of Idaho.

Custer County: Mackay, June 10, 1938 (Rees). Fremont County: Big Spring, July 5, 1934 (Rees) and June 10, 1936 (G. F. Knowlton).

Aedes cinereus Meigen

This small, dark mosquito was obtained in a number of collections in the southeastern part of Idaho and also in Owyhee County, indicating a wide distribution across the southern half of the state. It has been reported as a single-brooded species, but collections made in Idaho suggest several broods or at least continuous breeding over a large part of the season. *Cinereus* was observed to bite persistently in the shaded places along many of the smaller streams.

Bannock County: Arimo, July 11, 1945; Swan Lake, June 29, 1945. Bear Lake County: Fish Haven, June 28, 1933 (Rees); Montpelier, September 11, 1945. Bingham County: Blackfoot, July 2, 1934 (Rees). Franklin County: Preston, June 29, 1945. Owyhee County: Marsing, June 27, 1945.

Aedes dorsalis (Meigen)

This is probably the most important pest mosquito in Idaho. It was present in considerable abundance in nearly all localities where collections were made and it was observed from early season until late fall in all types of habitats except in the higher mountain areas. This species bites persistently out-of-doors during the daytime and will frequently invade houses when seeking a blood meal. It has been taken by the writers at several localities on numerous occasions from 1930 to 1945 in the following counties: Ada, Bannock, Bear Lake, Bingham, Blaine, Butte, Canyon, Cassia, Custer, Franklin, Fremont, Gooding, Jerome, Madison, Minidoka, Oneida, Owyhee and Twin Falls.

Aedes excrucians (Walker)

Bannock County: Pocatello, June 29, 1945. Fremont County: Big Spring, July 5, 1934 (Rees).

Aedes fitchii (Felt and Young)

This species was observed frequently in the lower mountain and foothill areas during early season. Several collections of *fitchii* were made in the valley regions where it was associated with *Aedes increpitus*, breeding in clear, overflow pools along the larger streams.

Ada County: Boise, June 28, 1945. Bannock County: Pocatello, June 29, 1945. Bear Lake County: Fish Haven, July 11,

1945. Bingham County: Blackfoot, July 2, 1934 (Rees). Custer County: Mackay, June 10, 1934 (Rees). Franklin County: Franklin, July 9, 1931 (J. S. Stanford); Preston, July 29, 1945. Fremont County: St. Anthony, July 6, 1933 (Rees). Kootenai County: Cœur d' Alene, August 17, 1937 (Rees). Minidoka County: Rupert, June 26, 1945.

Aedes flavescens (Müller)

Collected across the southern half of the state, but was not common in any locality visited.

Bear Lake County: Bear Lake, June 1, 1929 (Gertsch); Fish Haven, August 11, 1929 (Rees). Canyon County: Nampa, June 27, 1945. Minidoka County: Rupert, June 25, 1945.

Aedes idahoensis (Theobald)

This mosquito was observed in numerous localities in the southeastern part of Idaho, where it constitutes an important pest species because of its tendency to bite during the daytime in shaded or open areas. It is most abundant during spring and early summer.

Bear Lake County: St. Charles, July 5, 1935 (Knowlton). Bingham County: Blackfoot, July 11, 1945. Cassia County: Burley and Malta, June 26, 1945. Custer County: Mackay, June 10, 1938 (Rees). Franklin County: Preston, July 2, 1934 (Rees). Fremont County: Big Spring, July 5, 1934 (Rees), June 10, 1936 (Knowlton); St. Anthony, July 6, 1933 (Rees). Oneida County: Malad, May 7, 1934 (Rees).

Aedes increpitus Dyar

This is one of the more common, early-season species. It was found breeding in overflow pools along streams, particularly in the foothill regions. The females bite persistently during the daytime in shaded localities when opportunity affords.

Ada County: Boise, June 28, 1945. Bannock County: Arimo, June 29, 1945; Pocatello, July 11, 1945. Canyon County: Nampa, June 27, 1945. Cassia County: Malta, June 25, 1945. Franklin County: Preston, June 29, 1945. Latah County: Juliaetta, April 21, 1889 (J. M. Aldrich). Minidoka County: Rupert, June 26, 1945. Oneida County: Malad, June 26, 1945. Owyhee County: Marsing, June 27, 1945.

AEDES LATERALIS (MEIGEN)

This mosquito was taken by the writers only in the extreme western part of the state. Dyar reports it from Lewiston, near the Oregon state line. Mail refers to this species as *Aedes aldrichii* and considers it one of the dominant species of the state.

Canyon County: Caldwell, June 27, 1945. Latah County: Lewiston, June 16, 1902 (Aldrich).

AEDES NIGROMACULIS (LUDLOW)

This may be regarded as one of the more important pest species of the state, since it attacks persistently during the daytime, inflicting a painful bite. It was found widely distributed over the southern half of Idaho, and further collections will probably show it to be state-wide in distribution, except for the higher mountain areas. Breeding is apparently continuous throughout the season.

Ada County: Boise, August 14, 1945. Bannock County: Arimo, July 11, 1945. Bear Lake County: Fish Haven, August 11, 1929 (Rees); Montpelier, September 11, 1945. Bingham County: Blackfoot, July 11, 1945. Canyon County: Caldwell, August 17, 1945; Nampa and Wilder, June 27, 1945. Cassia County: Malta, August 19, 1945. Franklin County: Riverdale, September 9, 1934 (Knowlton). Gem County: Emmett, August 17, 1945. Owyhee County: Marsing, June 27, 1945.

AEDES NIPHADOPSIS DYAR AND KNAB

This species breeds in greatest numbers in shallow, alkaline pools in valley areas or along the lower foothills. It was taken only in the southcentral and southeastern parts of the state.

Bear Lake County: Fish Haven, June 1, 1930 (Rees). Cassia County: Burley, June 26, 1945. Franklin County: Preston, July 2, 1934 (Rees). Oneida County: Malad, May 7, 1934 (Rees).

AEDES PULLATUS (COQUILLETT)

Latah County: Juliaetta, April 21, 1889 (Aldrich).

AEDES STICTICUS (MEIGEN)

This species was found to be fairly numerous in shaded localities along the larger streams in the southern half of Idaho. The

females bite during the daytime in such localities but they were not observed to leave shaded places and seek blood meals during the daytime.

Ada County: Boise, June 28, 1945. Canyon County: Wilder, June 27, 1945. Cassia County: Malta, June 26, 1945. Franklin County: Preston, June 29, 1945. Oneida County: Malad, June 25, 1945. Dyar reports *sticticus* from Sandpoint, Bonner County, July 3, 1917.

Aedes stimulans (Walker)

This mosquito was found associated with the preceding species in shaded places along streams. The females bite severely during the daytime, particularly during cloudy weather.

Canyon County: Wilder, June 28, 1945. Franklin County: Preston, June 29, 1945. Oneida County: Malad, June 26, 1945.

Aedes triseriatus (Say)

Canyon County: Nampa, June 27, 1945.

Aedes trivittatus (Coquillett)

This species was taken during the daytime while biting in shaded places. The females inflict a painful bite and are extremely persistent when seeking blood meals.

Canyon County: Nampa, June 27, 1945. Owyhee County: Marsing, June 27, 1945.

Aedes vexans (Meigen)

This mosquito probably ranks next in importance to *dorsalis* as a pest mosquito in Idaho. It occurs in nearly all types of habitats and can be found from early summer until fall. The females will invade dwellings where they feed avidly during the night. They are also extremely annoying during the daytime in certain wooded localities. Collections have been made by the writers at several localities from 1929 to 1945 in the following counties: Ada, Bear Lake, Bannock, Bingham, Blaine, Canyon, Custer, Franklin, Owyhee and Twin Falls. Dyar reports it from Bonner County.

Culex apicalis Adams

This small, dark mosquito was taken at one locality along the

Payette River, resting beneath a bridge. The females were not observed to feed upon humans.

Gem County: Emmett, August 17, 1945.

Culex erythrothorax Dyar

Canyon County: Nampa, August 17, 1945.

Culex pipiens Linnaeus

This species may be regarded as an important indoor pest mosquito in certain parts of Idaho. It enters houses freely, often causing considerable annoyance, particularly during the latter part of the season.

Ada County: Boise, August 16, 1945. Bingham County: Blackfoot, July 11, 1945; Shelley, September 7, 1945. Canyon County: Caldwell and Nampa, August 17, 1945. Cassia County: Burley and Malta, June 26, 1945. Franklin County: Preston, July 11, 1945. Madison County: Rexburg, September 8, 1945; Rigby, September 7, 1945. Minidoka County: Rupert, August 16, 1945. Owyhee County: Marsing, June 27, 1945.

Culex restuans Theobald

This mosquito resembles the preceding species in general appearance and in its habit of entering dwellings. However, it appears to be less common and is not to be considered an important pest species in Idaho.

Ada County: Boise, August 16, 1945. Bingham County: Shelley, September 7, 1945. Cassia County: Burley, June 26, 1945. Madison County: Rigby, September 7, 1945. Twin Falls County: Twin Falls, August 20, 1945.

Culex salinarius Coquillett

Ada County: Boise, August 16, 1945. Canyon County: Nampa, August 17, 1945. Oneida County: Malad, July 11, 1945.

Culex tarsalis Coquillett

This species ranks high in importance as a pest mosquito in Idaho. It occurs throughout the season and enters houses freely, causing much annoyance. It was observed in tremendous numbers in stables, barns and other places where livestock were quartered and seems to prefer to feed upon domestic animals.

Collections were made by the writers from 1930 to 1945 at several localities in the following counties: Ada, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Canyon, Cassia, Elmore, Franklin, Fremont, Gooding, Jerome, Kootenai, Madison, Minidoka, Oneida, Owyhee, and Twin Falls.

Culiseta impatiens (Walker)

Fremont County: Ashton, September 8, 1945.

Culiseta incidens (Thomson)

Ada County: Boise, August 16, 1945. Bannock County: Arimo and Pocatello, July 11, 1945. Bear Lake County: Montpelier, September 11, 1945; Paris, August 12, 1945. Bingham County: Blackfoot, July 2, 1934 (Rees). Canyon County: Caldwell, August 17, 1945; Nampa and Wilder, June 27, 1945. Franklin County: Preston, June 29, 1945. Minidoka County: Rupert, June 26, 1945. Dyar reports this species from Moscow, Latah County.

Culiseta inornata (Williston)

This species is widely distributed and occurs throughout the season. Numerous collections have been made by the writers from 1929 to 1945 in the following counties: Ada, Bannock, Bear Lake, Bingham, Blaine, Butte, Canyon, Cassia, Franklin, Gooding, Jerome, Kootenai, Madison, Minidoka, Oneida, Owyhee and Twin Falls.

Culiseta morsitans (Theobald)

Specimens from which this record was taken were not examined by the authors.

Franklin County: Mink Creek, August 24, 1934 (Knowlton-C. F. Smith).

Anopheles freeborni Aitken

This malarial mosquito has been taken by the writers throughout the southern part of the state where it often occurs in great abundance in the vicinity of favorable breeding areas. It invades houses, particularly during the latter part of the season. Numerous collections have been made by the authors from 1930 to 1945 in the following counties: Ada, Bannock, Bear Lake, Bingham, Bonneville, Canyon, Cassia, Elmore, Franklin, Gooding, Jerome,

Madison, Oneida, Owyhee and Twin Falls. Luke reports it from Boise, Gem and Washington counties.

Anopheles occidentalis Dyar and Knab

Fremont County: Ashton, September 8, 1945. Madison County: Rexburg and Rigby, September 7, 1945. Luke reports it from Kellogg, Shoshone County.

Anopheles punctipennis (Say)

Fremont County: Ashton, September 8, 1945. It is reported by Luke from Boundary, Kootenai, Nez Perce and Shoshone counties.

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TWO NEW SPECIES OF PTILOGLOSSA FROM ARIZONA

(Hymenoptera, Apoidea)[1]

BY P. H. TIMBERLAKE[2]

University of California Citrus Experiment Station, Riverside, California

The Diphaglossine bees of South America have been represented in the United States by two species of *Caupolicana, C. yarrowi* (Cresson) in New Mexico and Arizona, and *C. electa*

[1]Paper No. 543, University of California Citrus Experiment Station, Riverside, California.

[2]Associate Entomologist in the Experiment Station.

(Cresson) in Georgia and North Carolina. It is now possible to add the genus *Ptiloglossa* to our fauna, as two species of this genus have been discovered recently in southern Arizona by Mr. W. W. Jones, of Douglas.

The genus *Ptiloglossa* Smith is similar to *Caupolicana* Spinola and has been included in that genus by some authorities. It differs, however, in having a distinct metallic luster on the abdomen, the second submarginal cell reduced in size and more or less narrowed or pointed above, and the eyes more convergent at the summits. In the male the outer spur of the hind tibia is not articulated, but is fused with the apex of the tibia. In the female the two basal joints of the hind tarsus are shorter and more broadly dilated than in *Caupolicana*.

The ocelli in both genera are more or less enlarged, befitting the crespuscular habits of these bees. Our southwestern species have been taken only for a short period before and after daybreak.

Ptiloglossa arizonensis Timberlake, new species

Resembles *P. eximia* (Smith) but differs in having the hair of tergites 2 to 4 usually entirely light and neither denser nor longer at apex of segments. It is probably even closer to *P. mexicana* (Cresson), but that species has fuscous hair intermixed on the pleura and sternum, and ochraceous hair intermixed with the fuscous on the last two tergites of the abdomen. Unless the male characters prove to be distinctive, this insect could be considered a race of *mexicana*.

Female. Black, with the tergum of abdomen dark blue-green (depressed margins of tergites sometimes lighter or more yellowish-green). Tip of long first flagellar joint, and following joints beneath, dark red. Tegulae and small joints of tarsi reddish ferruginous. Clypeus convex, dullish, more or less wrinkled and more or less closely punctured, the punctures rather small and more distinct on sides of disk. Posterior ocelli separated by a little more than their own diameter from the eyes. Frons and vertex dull, impunctate. Thorax dull, minutely granular-tessellate, with close, fine, shallow punctures. Enclosure of propodeum more shining, finely tessellate. Abdomen shining, very minutely tessellate and punctate. Second submarginal cell often narrowed to a rounded point above, so that the nervures meet and form a cross. Pubescence of head whitish, intermixed with long, dusky or fuscous hairs on face, margins of clypeus, occipital margin, and upper end of cheeks. Clypeus nude except around the margins. Pubescence of thorax extremely dense and plumose, fulvous above, be-

coming whitish on lower part of pleura, and more or less fulvous again on middle of sternum. Pubescence of abdomen ochreous, consisting of fine, simple, appressed hairs on disk of tergites 2 to 4; that of tergite 1 much longer, erect, and more fulvous. Hair of tergites 5 and 6 black, and a little black hair at sides of disk of tergites 2 to 4. Hair of venter reddish, mostly long and simple and arranged mostly as apical fringes, but hair on lateral margins much longer, plumose, and whitish. Hair on lateral margins of segment 1 extremely dense, plumose, and fulvous. Hair of legs ochreous, the long fringes on front femora and tibiae fulvous. Hair on outer side of middle and hind tibiae and basitarsi black, sharply contrasting with the pale ochreous, long, plumose hair on anterior margin of hind tibiae. Hair on inner side of middle and hind basitarsi coppery red. Wings pale fuliginous. Nervures brown, the costa and subcosta nearly black. Length, about 14 to 20 mm.; anterior wing, 11 to 14 mm.

In some specimens the short appressed hair on basal half, more or less, of disk of tergites 2 to 4 is dusky or blackish.

Described from a series of 77 females (*holotype* and *paratypes*) collected at PORTAL, ARIZONA, at flowers of *Solanum elaeagnifolium*, from July 20 to August 22, in 1943, 1944, and 1945 (W. W. Jones). The holotype is a female collected August 22, 1943. Unfortunately, the male was not discovered by Mr. Jones.

Ptiloglossa jonesi Timberlake, new species

Similar to *arizonensis*, differing in sculpture of clypeus and in color of pubescence on the legs.

Female. Differs from the female of *arizonensis* in the following particulars: Clypeus smooth, shining, sparsely and finely punctured, with a broad impunctate space on middle of disk. Pubescence on outer side of middle and hind tibiae and basitarsi dark reddish fulvous, with the long anterior fringe of the hind tibiae pale like the hair of hind femora, but not strongly contrasting as in *arizonensis*. Hair on tergites 5 and 6 fuscous, tinged with brown, not as black as in *arizonensis*. No trace of black or dusky hair on sides or base of tergites 2 to 4. Length, 16 to 19 mm.; anterior wing, about 13 mm.

Described from two females (*holotype* and *paratype*) taken at PORTAL, ARIZONA, with the preceding species, August 12, 1944, and July 22, 1945 (W. W. Jones).

The types of these two *Ptiloglossa* are in the collection of the Citrus Experiment Station, Riverside. Paratypes of *arizonensis* will be widely distributed to museums.

THE NESTING HABITS OF HETERANTHIDIUM LARREAE (CKLL.)

(Hymenoptera, Megachilidae)

BY J. W. MACSWAIN
University of California, Berkeley

The nesting habits of representatives of only five of the seven genera of non-parasitic Anthidiine bees occurring in North America have been recorded. Those of *Anthidium*, *Dianthidium*, *Callanthidium* and *Trachusa* are now well known through the publications of Hicks, Michener and others, while the nests of *Anthidiellum* have been briefly described by Schwarz (1928). It is hoped that the following note on a species of the genus *Heteranthidium* will add to the considerable information already available on this interesting tribe of bees.

Along the Pecos River near Loving, New Mexico, on May 11, 1945, a number of female *Heteranthidium larreae* (Ckll.)[1] were observed gathering pollen from creosote bush, *Larrea divaricata* Cav. In this area several dozen nests were found in a bare mound of hard-packed reddish-brown silt.

The individual burrows had been excavated by the females and consisted of circular holes, 6 mm. in diameter, which slanted into the ground 10 to 16 cm. and then went vertically for from 2½ to 4 cm. to terminate in an enlarged cavity 19 mm. in depth and 13 mm. at its greatest diameter. The vasiform cells, which were 16 mm. long, 6 mm. in the upper third and 7½ mm. at the greatest width, radiated out from the main cavity as numerous fingers. The cell walls were made from the surrounding soil and although slightly less than ½ mm. in thickness, they were cemented together by a resinous material in such a way that it was difficult to open them. Sufficient plant resin was impregnated into the cell walls to support combustion for several seconds. A semi-liquid pungent mass of pollen, with an unpleasant odor similar to iodine, filled the lower half of the provisioned cells. A single egg was deposited in each cell and then the cells were closed with a cap of the same materials used in the formation of the cell walls. The eggs were elongate, narrow and slightly curved, 4 mm. long by 1 mm. at the greatest diameter, with the

[1]Identification by P. H. Timberlake, Riverside, California.

ends inserted into the food mass. The larvae upon hatching fed on the surface, and continued feeding with the head down in later instars. Upon completion of feeding the larvae spun tough brown mammilate cocoons with the nippled ends facing the opening and with larval feces between the cocoons and the cell opening. The larvae overwintered and transformed to adults the following spring.

Michener (1944) has assigned the genus *Heteranthidium* a position between *Trachusa* and *Dianthidium* and his phylogenetic interpretation is borne out by the available biological information. The females of *Trachusa perdita* Ckll. construct their own burrows in the ground and use pieces of leaves cemented together with plant resin to form their cells. In addition a considerable number of pebbles and dirt particles are incorporated into the pitch-like material. In *Heteranthidium larreae* the burrows, which are constructed by the females, terminate in cells constructed of resinous material and soil particles. Among the many species of *Dianthidium* whose nests have been recorded, none construct their own burrow but build nests of resin usually with pebbles and occasional twigs on rocks, grasses, bushes and trees or in cavities in twigs, snail shells, door locks, etc.

These habits may be contrasted with those of species of *Anthidium* and *Callanthidium* which appropriate the burrows of other insects and use only plant down and pebbles in nest construction.

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